AMENDMENT

In response to the Office Action dated March 27, 2002, please amend the above-identified application as follows:

In the Specification

Please replace the paragraph located below "CROSS-REFERENCE TO RELATED APPLICATIONS" which begins and ends on page 1, line 9 with the following paragraph:

– This application was filed under 35 U.S.C. § 371 based upon PCT Application Number PCT/US99/28038, filed on November 24, 1999 which takes priority from U.S. Provisional Application Number 60/109,898, filed on November 25, 1998. –

Please replace the paragraph beginning on page 6, line 26 and ending on page 7, line 2 with the following paragraph:

– The detector area of these heterojunction diodes was about 1 cm^2, and wired in a "mesa" geometry. The neutron source was a small TRIGA-type reactor (V.A. Medical Center, Omaha, NE) with a flux of $1.6x10^6$ $n/cm^2 \cdot s$ based on calculations for the fission chamber. A heterojunction diode, reversed biased to about 3 V, was wired for pulse counting as shown in Figure 2 and inserted into the reactor. The resulting count rates with insertion are plotted in Figure 4. Background and noise counts are in the range of 250 to 300 Hz, and within the reactor, the count rate rises to $2x10^5$ Hz. –

Please replace the paragraph beginning on page 7, line 11 and ending on page 7, line 27 with the following paragraph:

– Given that almost all counts are attributable to neutrons and that the boron carbide film is about 1000 nm thick, the detection efficiency is thus about 1% as best seen in FIG. 5. Given that devices can be made with boron carbide of 50 micrometers to 100 micrometers in thickness and with depletion layers extending several micrometers, the single (thermal) neutron detection efficiencies are, conservatively, expected to reach 80% and higher in devices which simultaneously have exceedingly low γ-ray sensitivity (< 1% detection efficiency for

all energies greater than 100 keV and < 0.01% for all energies above 0.5 MeV, assured by the use of boron as the dominant atomic species) as best seen in FIG. 6. Since the neutron - ^{10}B interaction results almost exclusively in the yield of highly ionizing lithium ions and alpha particles of total kinetic energy about 1.5 MeV and the boron atoms form the major species in the active semiconducting regions of the devices, the boron-carbon alloy layer of the detector yields an enormous internal gain (considerably greater than 10^5) which is essentially noise-free and comparable with the gain of the intensifiers and photomultipliers commonly used in scintillation-based detectors and imagers. By using exclusively ^{10}B enriched boranes in the PECVD fabrication process, detection efficiency with thinner films can be considerably improved compared with devices whose ^{10}B content reflects the natural isotopic abundance, about 19% ^{10}B.–

Please replace the paragraph beginning on page 9, line 15 and ending on page 9, line 23 with the following paragraph:

– This invention can be used in various forms of solid-state neutron detectors presenting entrance detecting areas of order μm^2 to m^2. These detectors are capable of being implemented with very thin detecting and electrically active regions (≤ 1 μm minimum effective electrical thickness), with very low mass per unit detecting area, with efficiencies ranging up to nearly 100% even for single neutrons, with real-time response, with high spatial resolution (≤ 1 μm minimum), and with high temporal resolution. Of course, implementation may not always need to, or be able to, employ each of these attributes. As best seen in FIG. 3, voltage and power needs are slight, as are charge pulse processing requirements. –

REMARKS

A reconsideration of the present application is respectfully requested. The specification has been amended to correct the informalities pointed out by the Examiner. In addition, a Proposed Drawing Amendment is being submitted herewith. No claims have been added or amended. Claims 1-13 are pending in the application.